

DIFFICULTIES WHEN SOLVING SHARING SITUATIONS WITH GROUPING ACTIONS

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While grouping actions can be used to solve sharing situations, Brown (1992) notes that grouping modelling actions do not coherently make sense of sharing situations per se. This means that for instruction that supports children's sense-making, translations from sharing situations to grouping actions must be chained appropriately in an instructional explanation pathway. In this presentation, we share episodes from the first author's doctoral study on division instruction where this logic was disrupted in two key ways (Mathews, 2021). These ways are exemplified through episodes drawn from one of the six teachers in the broader study. Semiotic analysis involving study of the sequence of production of mathematical signs was used. Ten of the 64 episodes taught by the focal teacher involved grouping actions to produce answers in sharing situations.

Illustrating the first type of disruption seen in these episodes, the teacher began by stating: "Share 24 among 5. You can count in five". She then wrote " $24 \div 5 =$ " on the board and proceeded to draw four groups of 5 dots and circling them and counted in fives to 20. She then drew a remainder group of 4 dots and inserted the answer 4 remainder 4. In this episode, while the symbolic division calculation can be solved with a sharing or grouping action, there is no highlighting or acknowledgement of the shift from a sharing situation (share 24 among 5) to a grouping-oriented diagram production (four groups of 5 dots with four dots remainder). From the child's perspective, making sense of the situation to produce the answer is disrupted here as the situation silently shifts. Illustrating the second type, the teacher described "equal sharing" between 3 people. She took 6 sweets and distributed 2 sweets at a time to each of three learners and wrote $6 \div 3 = 2$. The answer is produced using prior knowledge of the quotient value, however, broader evidence in South Africa suggests that learners lack prior knowledge.

These two difficulties point to key ways in which sense-making is disrupted in the context of division teaching of sharing situations in South Africa. These disruptions shed light on low performance in division in the primary grades (Schollar, 2004).

References

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